

## Encapsulated blister package

The present invention relates to an encapsulated blister package, which is used as consumer package for medicines especially in the form of tablets, pills and capsules.

5 A blister package typically comprises a cover part of viscous, flexible, transparent plastics, which is laminated to a base of brittle, film-type material, such as foil paper. The plastic cover has blister-like protrusions, forming cavities between the cover and the base, each of them containing one packed article, such as a tablet or similar. The plastic material of the cover is sufficiently rigid so that the blisters  
10 would maintain their shape in the normal state, but yield when pressing the blister with a finger so that the tablet or other similar article can be pressed out of the package through the breaking base.

The present blister packages used as medicine packages are typically rectangular, comprising tablets, pills or similar arranged in vertical and horizontal lines. The  
15 consumer package consists of one or several such blister packages packed, for example, into a casing of cardboard.

Extracting a tablet or similar from the medicine package described above requires that the casing be opened, the blister package be pulled out of the casing, the tablet be removed from the blister package, and finally, the blister package be fitted back  
20 into the casing.

The object of the invention is to achieve an encapsulated blister package, from which a tablet or similar can be extracted more simply and effortlessly than at present. It is characteristic of the package of the invention that it has a flat, outer casing open at least from one side, and at least partly extractable inner part, which com-  
25 prises a disc formed as a blister package fitted rotatably onto a base, which is partly open below the disc so that the product to be released from the disc by pressing the blister can be removed from the package.

The structural basis for the encapsulated package of the invention has been a CD package disclosed in the patent specification US 6032795, which consists of an  
30 outer casing and a partly extractable inner part supporting the CD. Instead of a CD, the package of the invention comprises a discoidal blister package, which contains tablets or other similar articles individually packed into blister-like cavities. In distinction from the CD package of the said specification, the disc is not intended to be

removed from the base, but it is essential that the disc rotates in relation to the base so that it is possible to bring the tablet to be released at any given time into a position, in which it can be released from the disc by pressing.

5 The disc containing the tablets or other similar articles can be formed as such in a conventional way from a blister sheet of flexible plastic and a base of bristle material, such as foil paper, which breaks when the tablet is removed by pressing.

10 The base belonging to the extractable part of the package can consist of a sheet, which most suitably is closed, exclusive of an outlet opening formed into it, at which the tablet to be extracted from the package can be placed by rotating the disc and through which the tablet pressed out from the disc can be removed from the package. If the tablets are arranged in the disc as a circular line or ring, the outlet opening can be relatively small, covering only the area of the tablet to be released and the area immediately surrounding it. In this case, the tablets can be brought to the outlet opening by rotating the disc, and they can be pressed out of the disc one at  
15 a time. However, it is also possible to place the tablets to the disc in another way, for example, as several concentric arcs or rings, or possibly as a spiral surrounding the centre of the disc, in which case the area of the disc will be more efficiently used in the package. In these cases the base can be provided with a longitudinal outlet opening in the direction of the disc radius, to which each tablet can be brought for  
20 release irrespective of the location of the tablets on the disc.

With the exception of the defined outlet opening, the closed, unrotatable base onto which the disc is articulated, forms a solid structure, from which it is easy to release the tablets or other similar packed articles. Nevertheless, also other kinds of structures are possible within the scope of the invention. It is essential that the base, onto  
25 which the disc is supported, is open in such a way that it does not prevent the release of the tablet brought to this open area from the disc. According to one embodiment of the invention, the extractable base comprises an unrotatable frame, which supports two superimposed discs rotating in relation to the frame and to each other, the upper one forming the blister package containing the tablets or other similar articles,  
30 and the lower one being provided with an outlet opening making it possible to press off the tablet. In this case, releasing the tablets requires the matching of the tablet and the outlet opening by rotating the superimposed discs in relation to each other.

According to a further embodiment of the invention the tablets or other similar articles are arranged on the disc forming the blister package so that a sector totally free  
35 of tablets remains in the disc. The idea here is that, when manufacturing the pack-

ages, the said sector is placed at the outlet opening in the otherwise closed base so that it is not enough to extract the base and disc out from the casing to release the tablet, but the disc has to be additionally rotated in relation to the base before the tablet can leave the package. This, as also the said solution consisting of two super-  
5 imposed discs, are suitable for medicine packages, especially from the point of view of child safety.

The disc can be rotatably connected to the base by articulating the disc to the base from its middle section. The base can comprise a joint pin, around which the disc rotates by pressing by a finger.

10 Alternatively, the extractable inner part can be provided with a retainer, which extends onto the disc from the side of the base and keeps the disc in place on the base. Such a retainer can be made, for example, as a ring-shaped rim encircling the circumference of the disc so that the edge of the disc is left between the sheet-shaped base and the rim. The said joint between the disc and the base will not be needed in  
15 this embodiment, but the disc can freely rest on the base and be rotated by pressing by fingers.

The invention can also be advantageously applied so that a projection or some other hindrance is placed to the disc and/or base, allowing the disc to rotate to one direction only. One implementation is to provide the said rim surrounding the disc with a  
20 tongue extending towards the centre of the disc, the tongue having at least one fin extending down towards the disc and turning to only one direction, which the blister in the disc can pass in the said turning direction, but not in the opposite direction of rotation of the disc. This solution helps the consumer to release the tablets or similar from the package in the order, in which they are located on the disc.

25 As the CD casing according to the said specification US 6032795, also the encapsulated package of the invention, the disc excluded, can be manufactured of package cardboard, which is an inexpensive recyclable material for disposable consumer packages to be disposed of after the use.

30 The invention shall next be explained in more detail by means of examples, referring to the enclosed drawings, in which

Figure 1 shows an encapsulated medicine package according to the invention, the inner part extracted;

Figure 2 shows the package of Figure 1 with its extracted inner part seen from the bottom;

Figure 3, which is a section III-III of Figure 2, shows the edge folds, by means of which the detachment of the inner part of the package from the casing is prevented;

- 5    Figure 4, which is a partial section IV-IV of the inner part of the package of Figure 2, shows a tablet included in the discoidal blister packaged, placed at the outlet opening in the base;

Figure 5, which is otherwise similar to Figure 2, illustrates the tablet, which is pressed out from the disc, exiting from the package through the outlet opening;

- 10   Figure 6 illustrates the way the tablet included in the disc, which as an alternative embodiment of the invention deviates from the illustrations in Figure 4 and 5, rotates to the outlet opening in the base;

Figure 7 illustrates the disc formed as a blister package as an embodiment of the invention, in which the packed tablets are arranged as a ring;

- 15   In the alternative embodiment of the invention according to Figure 8, the tablets are arranged on the disc as a spiral;

In the embodiment of the invention according to Figure 9, the tablets are arranged on the disc as two concentric arcs of a circle so that the disc comprises an empty sector without tablets;

- 20   Figure 10, which corresponding to Figure 2, shows the bottom side of the package, illustrates an embodiment of the invention, in which the base has a longitudinal outlet opening in direction of the disc radius;

Figure 11 is a top view of an encapsulated medicine package of the invention, as an alternative to the one shown in Figure 1, the inner part extracted;

- 25   Figure 12 is a section XII-XII of Figure 11;

Figure 13 is a section XIII-XIII of Figure 11; and

Figure 14 is a section XIV-XIV of Figure 11.

The encapsulated medicine package of the invention illustrated in Figures 1 and 2 consists of the flat, rectangular outer casing 1 and the extractable inner part 2. The

- outer casing 1, which has been manufactured of package cardboard by folding and seaming, has three closed lateral edges 3 and an open fourth edge 4, from which the inner part 2 can be extracted. Corresponding to the casing 1, the inner part 2 comprises the mainly rectangular base 5 and the disc 7 supported by the base, rotating  
5 around the joint pin 6 in the base, the disc forming the blister package containing the packed articles, which in the exemplary case in the Figures are the medicine tablets 8. Figure 2 illustrating the bottom section of the package shows the outlet opening 9 formed into the otherwise closed base 5, making it possible to remove from the package the tablet 8 released from the disc 7.
- 10 From one side, the sheet-shaped base 5 has been folded so that, in a closed package, in which the inner part 2 is pressed into the casing 1, the fold 10 forms the lateral edge closing the open edge 4 of the casing. From the sectional view 3 it can be seen that the opposite edge of the base 5 is provided with the similar fold 11, which in  
15 cooperation with the inner fold 12 on the open edge 4 of the casing 1 prevents the inner part 2 from loosening from the casing in connection with the extraction. This ensures that the package stays in one piece when used, which is the central precondition for its effortless use. The base 5 can be manufactured of a sheet of package cardboard by folding the sides 10, 11 and by die cutting the outlet opening 9 for the tablets.
- 20 The structure and operation of the discoidal blister package 7 in the release of the tablets 8 are illustrated in Figures 4 and 5. The disc 7 consists of the blister sheet 13 of a plastic material, to which a thin base film 14 has been laminated. The blister sheet 13 has projections (blisters) 15 so that the blisters form cavities 16 between the sheet 13 and the base 14, each cavity containing one packed tablet 8. The blister  
25 sheet 13 is made of a relative rigid plastic material, which keeps it shape in the normal state, but which, nevertheless, bends when the blister 15 is pressed by a finger so that the force is directed to the tablet 8 and through it to the base film 14 below. The base film 14 is, for example, made of a brittle foil paper, which breaks when pressed, thus allowing the tablet 8 to release and exit from the package through the  
30 outlet opening 9 under the base in accordance with Figure 5.
- The structure of the discoidal blister package 7 in Figure 6 deviates from the one shown in Figures 4 and 5 in that the cardboard sheet 17 stiffening the disc 7 has been laminated under the breaking foil 14 of foil paper or a similar material. The sheet 17 has openings 18 corresponding to the outlet opening 9 in the base 5, each at  
35 the tablet 8 and the blister 15. Figure 6 illustrates the rotation of the disc 7, in which the blister 15 with the tablet 8 is about to arrive at the outlet opening 9 in the base.

In Figures 2, 4, 5 and 6, the outlet opening 9 formed to the base 5 is relatively small, covering only the blister 15 containing the tablet 8 and the immediately surrounding area in the disc 7. Such an outlet opening 9 is sufficient for a discoidal blister package, in which the blisters 15 with tablets 8 are arranged as a ring encircling the disc 7 in accordance with Figure 1 or Figure 7. By rotating the disc 7, the tablets 8 can be brought to the outlet opening 9 in the base 5 and removed from the package through the opening one at a time. The base 5 can, for example, have a cogging or some other suitable mechanism (not shown) connected to the joint pin 6, allowing the disc 7 to only rotate in one direction on the base. This guides the consumer to use the tablets 8 in the order, in which they are located on the disc 7.

Figures 8 and 9 show two alternative configurations, in which the blisters 15 with tablets 8 can be located on the disc 7. In Figure 8, the tablets 8 are arranged as a spiral encircling the joint pin 6, which forms the centre of the disc. In Figure 9, the tablets 8 again form two concentric, nested arcs of a circle. In this case, the disc 7 comprises the empty sector 19 free from tablets 8, indicated by broken lines in the Figure. In a full, unopened package, such a disc 7 is placed so that the said sector 17 is located at the outlet opening 9 of the base 5, in which case releasing the first tablet 8 from the package requires that, in addition to the extraction of the inner part 2, also the disc 7 has to be rotated in relation to the base 5. For the discs 7 according to Figures 8 and 9, the outlet opening 9 of the base 5 has been designed longitudinal, extending in the direction of the disc radius so that each of the tablets 8 arranged to the spiral or concentric rings or arcs can be brought to the opening 9 for release from the package.

In the embodiment of the invention of Figures 11-14, the extractable inner part 2 of the medicine package comprises, in addition to the sheet-shaped base 5 and the disc 7 supported by it, a projection bending inwards from the side 10 of the base towards the disc 7, forming the uniform annular rim 20 encircling the circumference of the disc. The rim 20 is dimensioned so that the edge 21 of the disc 7 stays completely under the rim, in a space between it and the base 5, at the same time as the rim leaves the blisters 15 with the tablets 8 in sight, with the exception of one. The rim binds the disc onto the base 5 so that the joint pin 6 described above for keeping the disc in place is unnecessary. The disc 7 can be rotated on the base 5 with fingers in the direction of the arrow 22 in Figure 11. Such an arrow can be located on the disc 7 to guide the user of the package. The edge of the rim 20 can be provided with the fold 23, which can either be continuous or consist of separate tongue-shaped projections, and which extends towards the disc 7 for restricting the freedom of movement

of the disc in the vertical direction. Let it be stated that, with the exception of the joint pin fastening, the disc 7 and the base 5 can structurally and operationally correspond to what has been disclosed above in connection of Figures 4 and 5.

5 According to Figure 11, the rim 20 covering the edge 21 of the disc 7 is additionally provided with the tongue 24, which is radially directed towards the centre of the disc. Upon rotating the disc 7, the blisters 15 arranged onto it as a ring travel one at a time below the tongue 24. In the direction of travel of the blisters 15, the fin 25 is arranged on both sides of the tongue 24 in accordance with Figure 14, the fin extending bevelled against the surface of the disc 7. The fins 25 act as gates opening to  
10 one direction, by allowing the blister 15 to pass by turning into the position shown by broken lines in the Figure, but forming a hindrance for the blister if one tries to turn the disc 7 to the opposite direction. The tongue 24 with its fins 25 thus allows the disc 7 to only rotate to the direction indicated by the arrow 22 on the disc, which helps to guide the blisters with their tablets 8 to the outlet point 9 in the order, in  
15 which they are located on the disc. The solution is especially suitable for packages, the course of medical treatment contained in which consists of tablets different from each other, which the patient has to take in a certain, predetermined order.

It is obvious for those skilled in the art that the embodiments of the invention are not limited to those disclosed as examples above, but they may vary within the scope of  
20 the following patent claims. For example, it is possible to restrict the output of the inner part 2 from the casing 1 so that the disc 7 will come into view only in part. A disc, which has been extracted out from the casing approximately halfway, is still easily rotatable with fingers, while keeping the package more compact and thus easier to handle.